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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,314	02/17/2004	Youzhi E. Xu	42390P13563D	4855

7590

10/05/2006

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EXAMINER

SCHATZ, CHRISTOPHER

ART UNIT

PAPER NUMBER

1733

DATE MAILED: 10/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/781,314

Applicant(s)

XU, YOUZHI E.

Examiner

Christopher T. Schatz

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 27-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 27-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed February 17, 2004 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the submitted IDS is not in proper format. Applicant is advised that submitting a signed copy of the information disclosure statement and Notice of References Cited from the Parent case, does not constitute a proper IDS. Applicant is required to submit an unsigned PTO-1449 form with the references to be considered. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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2. Claims 27 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Matayabas et al. (2003/0128521).

Matayabas et al. discloses a system comprising a printed circuit board; and an integrated circuit package mounted on the printed circuit board, the integrated circuit package comprising an integrated circuit, an integrated heat spreader thermally coupled to a backside surface of the integrated circuit, and a thermal interface material disposed between the backside surface of the integrated circuit and a bottom surface of the integrated heat spreader, the thermal interface material covalently bonded to the bottom surface of the integrated heat spreader and/or the backside surface of the integrated circuit (figure 1, paragraphs 0022, 0028-0031). As to claim 30, Matayabas et al. discloses a system wherein the integrated circuit package is a C4 package (figure 1).

3. Claims 27 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakanishi et al. '783

Nakanishi et al. discloses a system comprising a printed circuit board; and an integrated circuit package mounted on the printed circuit board, the integrated circuit package comprising an integrated circuit, an integrated heat spreader thermally coupled to a backside surface of the integrated circuit, and a thermal interface material disposed between the backside surface of the integrated circuit and a bottom surface of the integrated heat spreader, the thermal interface material covalently bonded to the bottom surface of the integrated heat spreader and/or the backside surface of the integrated circuit (figure 9, columns 1-2). As to claim 30, Nakanishi et al. discloses a system wherein the integrated circuit package is a C4 package (figure 9).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matayabas et al. Matayabas et al. discloses a system as discussed in claim 27 above. The reference further discloses an exemplary embodiment wherein the thermal conductivity of the TIM is 3.4 W/m K. Matayabas et al. also discloses that the thermal conductivity can be varied depending on several factors, and that one of ordinary skill in the art would have readily recognized varying the thermal conductivity (paragraphs 0030-0031). At the time of the invention it would have been obvious to one of ordinary skill in the art to vary the thermal conductivity of the TIM such that said conductivity is greater than 4 W/m K in order to achieve desired performance characteristics of the TIM.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi et al. as applied above, and in further view of Takeuchi (2003/0122242).

Nakanishi et al. discloses a system as discussed above, but the reference is silent as to a system wherein the TIM comprises an epoxy. Takeuchi discloses a system with an integrated circuit mounted and printed circuit board, wherein a thermal interface material is comprised of epoxy. The reference further discloses that using epoxy as a TIM is a suitable material and well known in the art (paragraph 0020). At the time of the invention it would have been obvious to a

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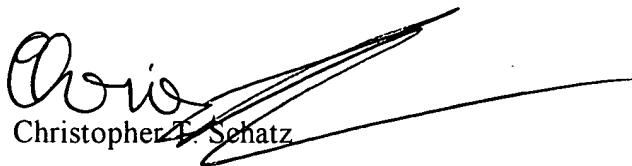
person of ordinary skill in the art to use epoxy as the TIM of Nakanishi et al. as is well known in the art and taught by Takeuchi.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Christopher T. Schatz** whose telephone number is **571-272-1456**. The examiner can normally be reached on 8:00-5:30, Monday -Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Christopher T. Schatz


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